

What is claimed is:

1. A motor comprising:
 - a stationary shaft;
 - a hub comprising a rotor, wherein the hub is rotatable about the central axis with respect to the shaft;
 - a thrust plate coupled to the shaft; and
 - a counter plate coupled to the hub and having the shaft extending therethrough, the counter plate and the thrust plate defining at least a portion of a fluid dynamic bearing, wherein at least a portion of the counter plate and the thrust plate form an axially oriented capillary seal therebetween.
2. The motor of claim 1 further comprising
 - a base having a first end of the stationary shaft coupled thereto; and
 - a cover plate coupled to base and having a second end of the stationary shaft coupled thereto.
3. The motor of claim 1, wherein the thrust plate further comprises:
 - an outer surface facing and diverging from an inner surface of the counter plate.
4. The motor of claim 1, wherein the thrust plate further comprises:
 - an upper surface at least partially facing the counter plate;
 - a lower surface at least partially facing the hub; and
 - a passage formed between the upper and lower surfaces and at least partially aligning with the capillary seal.
5. The motor of claim 4, wherein the hub further comprises:
 - a fluid re-circulation hole formed therein at least partially aligning with the passage formed in the thrust plate.

6. The motor of claim 4, wherein at least one of the hub and thrust plate further comprises:
 - a plurality of pumping grooves formed therein radially outward of the passage.
7. The motor of claim 1 further comprising:
 - an asymmetric seal comprising a grooved pumping seal near a lower end of the shaft and the capillary seal near an upper end of the shaft;
8. The motor of claim 1, wherein the thrust plate further comprises:
 - a cylindrical portion coupled to the shaft; and
 - a flange extending radially outward from the cylindrical portion.
9. The motor of claim 8, wherein the flange of the thrust plate further comprises:
 - an upper surface at least partially facing a bottom surface of the counter plate; and
 - a lower surface facing a working surface of the hub.
10. The motor of claim 1 further comprising
 - a hydrodynamic bearing defined between the hub and the shaft.
11. The motor of claim 1 further comprising:
 - a disk carrying member coupled to the hub.
12. A motor comprising:
 - a base;
 - a cover coupled to the base;
 - a stationary shaft coupled to the base at a first end and coupled to the cover at a second end;
 - a hub comprising a rotor, wherein the hub is rotatable about the central axis with respect to the shaft;
 - a fluid dynamic bearing defined the hub with the shaft;

- a thrust plate coupled to the shaft;
- a counter plate coupled to the hub;
- a divergent capillary seal defined between the thrust plate and the counter plate; and
- a stator coaxial with the shaft for rotating the hub relative to the shaft.

13. The motor of claim 12, wherein the capillary seal is defined between an outer surface of the thrust plate and an inner surface of the counter plate.

14. The motor of claim 13, wherein at least one of the outer diameter surface of the thrust plate and the inner diameter surface of the counter plate is oriented at an acute angle relative to the second end of the shaft.

15. The motor of claim 13, wherein an interface between an outer surface of the thrust plate and an inner surface of the counter plate is flared.

16. The motor of claim 12, wherein the thrust plate further comprises:

- a cylindrical portion coupled to the shaft; and
- a flange extending radially outward from the cylindrical portion.

17. The motor of claim 16, wherein the flange of the thrust plate further comprises:

- an upper surface at least partially facing a bottom surface of the counter plate;
- a lower surface facing a working surface of the hub; and
- a passage formed between the upper surface and lower surface; the passage at least partially aligning with the capillary seal.

18. The motor of claim 17, wherein the flange of the thrust plate further comprises:

- at least one re-circulation hole formed the hub and at least partially aligned with the passage.

19. The motor of claim 17, wherein at least one of the hub and thrust plate further comprises:

a plurality of pumping grooves formed therein radially outward of the passage.

20. The motor of claim 12 further comprising:

a disk carrying member coupled to the hub.

21. A disc drive spindle motor for rotating at least one disc about a central axis in a storage device, comprising:

a shaft having a first end and a second end, where the second end is supported from a base;

a hub comprising a rotor and a disc carrying member, wherein the hub is rotatable about the central axis with respect to the shaft;

a cover plate affixed to the first end of the shaft; and

a thrust plate coupled to the shaft; and

a counter plate coupled to the hub and having the shaft extending there through, the counter plate and the thrust plate defining at least a portion of a fluid dynamic bearing, wherein at least a portion of counter plate and the thrust plate form a capillary seal therebetween;

an asymmetric seal comprising a grooved pumping seal near the second end of the shaft and the capillary seal near the first end of the shaft;

at least one first fluid re-circulation path provides for independent flow of the bearing fluid through the fluid dynamic bearing for the purpose of decoupling individual bearing forces; and

at least one second fluid re-circulation path provides for flow of the bearing fluid from the fluid dynamic bearing to the capillary seal for the purpose of purging any ingested air from the bearing fluid.

22. The motor of claim 21, wherein at least one of the hub and thrust plate further comprises:

a plurality of pumping grooves formed therein radially outward of the fluid re-circulation path that provides for flow of the bearing fluid to the capillary seal.

23. The motor of claim 21, wherein the at least one first fluid re-circulation path is at least partially axially aligned with the at least one second fluid re-circulation path.